Rec'd PCT/PTO 15 JUN 2005
(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization

International Bureau



## | 12012 | 160120 | 1 00110 | 16010 | 16010 | 16010 | 16110 | 16110 | 16110 | 16110 | 16110 | 16110 | 16110 | 1

(43) International Publication Date 8 July 2004 (08.07.2004)

**PCT** 

(10) International Publication Number WO 2004/057414 A1

(51) International Patent Classification?: (1/1335

G02F 1/1333,

(21) International Application Number:

PCT/IB2003/005672

- (22) International Filing Date: 1 December 2003 (01.12.2003)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 2002-370825

20 December 2002 (20.12.2002) JF

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): SHIBAZAKI, Minoru [JP/JP]; c/o Philips Japan, Ltd., Philips Bldg., 2-13-37 Kohnan, Minato-ku, Tokyo 108-8507 (JP).

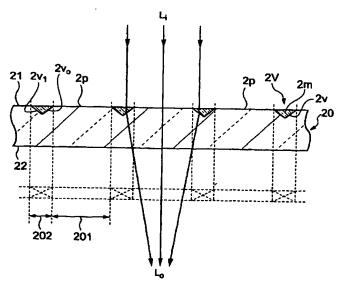
- (74) Agent: AOKI, Hiroyoshi; c/o Philips Japan, Ltd., Philips Bldg., 2-13-37, Kohnan, Minato-ku, Tokyo 108-8507 (JP).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OPTICAL SUBSTRATE, DISPLAY DEVICE USING THE SAME AND THEIR MANUFACTURING METHODS



(57) Abstract: An object of the invention is to provide an optical collective substrate and a display device using it, which can make effective use of light while avoiding generation of chromatic aberration in transmitted light. An optical substrate (20) of an optically transmissive material having a structure in which incident light Li from one principal plane (21) side of the substrate is locally focused toward an array of apertures (201) formed on the other principal plane (22). The one principal plane (21) is provided with grooves 2v being filled with an optically transmissive substance 2m of a predetermined refractive index, the filled groove portions 2V allowing the incident light Li from the one principal plane (21) side to be collected onto the respective apertures (201).

